REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Final Official Action of April 19, 2005, relating to the above-identified application.

The claims in the case are Claims 21 to 47.

The rejections of Claims 21-47 under 35 U.S.C. § 102(b) or alternatively, under 35 U.S.C. § 103(a), are traversed and reconsideration is respectfully requested. The Final Office Action relies on *Mutti, et al.* (*Applied Physics Letters*, vol. 66, no. 7, 1995, pgs. 851-853).

It is noted that the previous rejection of Claims 21 to 38 under 15 U.S.C. 102(b) and 35 U.S.C. § 103(a) in view of *Fujita* (*Applied Physics Letters*, vol. 74, no. 2, 1999, pgs. 308-310) has been withdrawn.

Briefly summarized, the present invention relates to nanocomposite materials that are photoluminescent at ambient temperatures in the visible red or infrared regions. Nanocomposite materials are featured by containing at least one material the crystals of which have dimensions in the range of nanometers.

The application, on pg. 1, beginning at line 11, explains the general background relating to photoluminescence in silicon. That section of the application also introduces the subject of nanocomposite materials. Nanocomposite photoluminescent materials have potential application as light sources, as well as for use in electronic devices.

State of the art is discussed on page 2 of the application, including references to several articles from the *Journal of Applied Physics*, including the article of *Mutti, et al.*, see line 16. *Mutti, et al.* neither anticipates nor renders *prima facie* obviousness the subject matter of Claims 21-47 in the application.

Mutti, et al., cited in the application on page 2, line 16, as among the most relevant prior art, discloses that silicon nanocrystals in silicon implanted silica layers show a red-light band with a peak beyond 750 nm, but only after thermal annealing at 1000° C. That is, the material of *Mutti, et al.* is photoluminescent in the red-light region, but only if the material is treated at, or higher than, 1000°. See the Abstract, page 1, of *Mutti, et al.* *Mutti, et al.* states on page 1, col. 2, last paragraph: "The red-light emission band is present only after thermal annealing at 1000° C for the highest fluence implant...". The material of *Mutti, et al.* is thus not photoluminescent in the red-light region at ambient temperatures and so is distinctly different from the nanocomposite material defined by the present claims. Consequently, *Mutti, et al.* does not describe the claimed subject matter within the meaning of 35 U.S.C. § 102.

Neither are there any suggestions, reasons or motivation in *Mutti, et al.* whereby a person skilled in the art would arrive at the process of producing the product or the product itself as defined in the present claims. Nothing would lead a person having ordinary skill in the art to modify the *Mutti, et al.* method of making the substances so as to have photoluminescence in the red light region, or to create a material having photoluminescence in the infrared region at ambient temperature and having infrared absorbance.

The method by which silicon nanocomposites are made has a determining influence on the properties of the product. See, for example, *Mutti, et al.*, page 851 left column:

> ...Also, from the fundamental point of view, the possibility to produce silicon nanocrystals by silicon implantation enables one to rule out some of the alternative mechanisms which have been proposed to explain the luminescence of porous silicon like the presence of Si_mH_n compounds, if materials not containing hydrogen are used for the implantation, or stress in the nanocrystals, if an adequate thermal recovery is performed.

Mutti, et al. thus acknowledges that luminescence depends on the method of preparation. Applicants' method of preparation is not disclosed by *Mutti, et al.*

Mutti, et al. teaches that intensity of the red-light emission band increases strongly with annealing time; see, last paragraph, p. 851 to 852. After 5 hours annealing time, the part at 600-750 nm is more enhanced than the part at 400-600 nm as shown by Figure 2, p. 852, where the maximum appears at 770 nm. *Mutti, et al.* does not disclose a material having a red-light emission at ambient temperature of at least 780 nm as defined in Claim 40.

In summary, the Office Action does not contain any reason or suggestion, or provide an explanation of motivation, for a person skilled in the art to select the reactive conditions defined herein with the expectation of obtaining a successful product with the characteristics as defined in the claims.

Applicants make of record herein several documents obtained from the Internet which define the term "ambient temperature". It is clear that persons skilled in the art would recognize that "ambient temperature" means the range of about 21 to 27° C or room temperature; Exhibit 1 – Schlumberger; Exhibit 2 – National Instruments; and Exhibit 3 – The Free Dictionary.

For the reasons set forth above, applicants respectfully submit that the rejections are not proper and should be withdrawn.

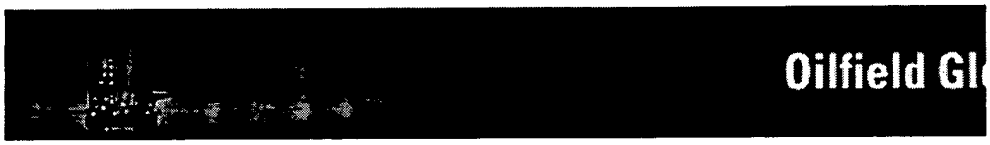
Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

SMITH, GAMBRELL & RUSSELL, LLP

By: _____
Robert G. Weilacher, Reg. No. 20,531

Suite 3100, Promenade II
1230 Peachtree Street, N.E.
Atlanta, Georgia 30309-3592
Telephone: (404): 815-3593
Facsimile: (404): 685-6893



ambient temperature

1. *n.* [Well Completions]

The temperature at a point or area expressed as an average of the surrounding areas or ma
Ambient surface temperature is generally given to be 70 to 80°F [21 to 27°C]-an average of seasonal variations.

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EXHIBIT
1

ambient temperature

Definition:

The normal operating temperature in an environment. *Ambient temperature* usually means room temperature.

Units:

degrees C

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EXHIBIT 2

TheFreeDictionary.com
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Free tools for surfers: Instant word lookup for your browser - Word o
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Ambient temperature

Word: ambient temperature | Word | Look it up

Sponsored links

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www.starware.com

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Make Overstock.com your one-stop-shop for all your media needs. Find the latest book, movie, music and gaming titles at deep discounts. Flat-rate shipping. Overstock - your online outlet.
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Temperature Consultants
A global engineering and scientific consulting firm providing product and process development, failure analysis, forensic experts, manufacturing and management consulting services.
www.rapid-response-consulting.com

Outside temperature at any given altitude, preferably expressed in degrees centigrade.

Some words with "ambient temperature" in the definition:

ambient
Homoiothermal

◀◀ Previous | **General Dictionary Browser** | Next ▶▶

ambiance	Ambidextrously	Ambigenous	Ambiguousness
Ambidexter	ambidextrousness	Ambigu	Ambilevous
ambidexterity	Ambien	ambiguity	Ambiloquy
Ambidextral	ambience	ambiguous	Ambiparous
ambidextrous	ambient	ambiguously	ambipolar

Full Dictionary Browser

■ambidextrous	◈ambient	■AmbientCalculiOnline	◈ambiguous external genitalia
●Ambidextrously	●ambient	■AmbientCalculusOnline	■Ambiguous genitalia
●ambidextrousness	■ambient	●Ambigenous	■Ambiguous grammar
■Ambiela, Miguel	■Ambient calculus	●Ambigu	■Ambiguous image
●Ambien	■Ambient electronica	●ambiguity	◈ambiguous nucleus
◈Ambien	■Ambient house	●ambiguity	●ambiguous user
■Ambien	●ambient lighting	■ambiguity	■Ambiguous viewpoint
●ambience	■Ambient music	■ambiguity	●ambiguously
●AMBIENS	■Ambient noise level	●ambiguous	●Ambiguousness
●ambient	■Ambient techno	■ambiguous	■Ambika

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EXHIBIT 3